National Institute of Environmental Health Sciences

Effect of temperature on the development of Schistosoma japonicum within Oncomelania hupensis, and hibernation of O-hupensis

Author(s): Yang GJ, Utzinger J, Sun LP, Hong QB, Vounatsou P, Tanner M, Zhou XN
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Abstract:

The objectives of this investigation were to assess the effect of temperature on the development of Schistosoma japonicum harboured in Oncomelania hupensis and to determine the lowest temperature threshold at which the hibernation of O. hupensis occurs. In the first experiment, adult infection-free O. hupensis, collected from Jiangsu province in eastern China, were infected with S. japonicum miracidia and raised at different temperatures under laboratory conditions. The development of miracidia until the release of cercariae was monitored employing the cercarial shedding method. In the second experiment, batches of O. hupensis were kept at temperatures below 13 degrees C with the temperature gradually reduced. Snail activity was assessed by a pin puncture method. We found a positive relationship between the development of S. japonicum within O. hupensis and temperature. In snails kept at 15.3 degrees C, S. japonicum arrested their development, while the fastest development occurred at 30 degrees C. The temperature at which half of the snails were in hibernation (ET50) was 6.4 degrees C. Our results underscore the pivotal role temperature plays on the biological activity of O. hupensis and the development of S. japonicum within the intermediate host. These findings are likely to have implications for the transmission of schistosomiasis in a warmer future China.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Temperature

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Schistosomiasis

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content